

What is claimed is:

1 1. A display device comprising:

2 a display cell which includes a display optical element and displays an image by
3 controlling light transmission based on a drive voltage applied to the display optical element;
4 and

5 a voltage supply circuit which randomly determines a polarity of the drive voltage in
6 a predetermined frame, and which determines a polarity of the drive voltage in a frame
7 subsequent to the predetermined frame by reversing the randomly determined polarity.

1 2. The display device according to claim 1, wherein said display cell has a plurality of pixels
2 arrayed in a dot matrix form having rows and columns, and said voltage supply circuit performs
3 random polarity determination in units of row constituting the dot matrix.

1 3. The display device according to claim 2, wherein said voltage supply circuit supplies the
2 drive voltage such that adjacent pixels in the same row are different from each other in polarity.

1 4. The display device according to claim 1, wherein said voltage supply circuit alternately
2 repeats the random polarity determination and the polarity determination by reversal.

1 5. The display device according to claim 1, wherein said voltage supply circuit repeats the
2 polarity determination by reversal multiple times after the random polarity determination.

1 6. A liquid crystal display device comprising:

2 a liquid crystal display cell having a plurality of pixels arrayed in m rows and n
3 columns, and having a plurality of scanning lines and signal lines respectively for transmitting
4 scanning signals and display signals to each of the pixels;

5 a scanning signal supply circuit for supplying the scanning signals to the plurality of
6 scanning lines;

7 a display signal supply circuit for supplying the display signals of different polarity to
8 adjacent signal lines; and

9 a control unit for supplying a polarity instruction signal to the display signal supply
10 circuit based on a random number for the pixel positioned in a predetermined column in each
11 pixel row.

1 7. The liquid crystal display device according to claim 6, wherein said scanning signal supply
2 circuit supplies each of the pixels in a first frame with polarity determined by the polarity
3 instruction signal based on the random numbers, and supplies each of the pixels in a second
4 frame with polarity reverse to that of the first frame.

1 8. The liquid crystal display device according to claim 6, further comprising:

2 a dot reversal drive mode for realizing a first frame in which adjacent pixels have a
3 different polarity from each other, and a second frame in which the polarity of each pixel
4 thereof is different from that of the first frame, the second frame being subsequent to the first
5 frame.

1 9. A liquid crystal display device of an active matrix type having an element for applying a
2 drive voltage to a liquid crystal material, the liquid crystal display device comprising:

3 a liquid crystal display cell having a plurality of pixels arranged in a dot matrix form
4 and the liquid crystal material sealed therein;

5 a control unit for transmitting generated random numbers; and

6 a polarity instruction unit for applying a polarity corresponding to each of the random
7 numbers received from said control unit to a predetermined pixel, and for instructing positive
8 and negative polarities of other pixels present in the same row to be alternately arrayed by
9 using the polarity of the predetermined pixel as a reference.

1 10. The liquid crystal display device according to claim 9, wherein the plurality of pixels are
2 arrayed in m rows and n columns (m and n are positive integers), said control unit sequentially
3 generates m random numbers for each predetermined frame, and said polarity instruction unit
4 determines the polarity of the predetermined pixel by allocating the m random numbers to each
5 row.

1 11. The liquid crystal display device according to claim 9, wherein said polarity instruction unit
2 determines a polarity of the predetermined pixel, and determines polarities of other pixels in
3 the row in which the predetermined pixel exists by using the polarity of the predetermined
4 pixel as a reference.

1 12. A liquid crystal display device comprising:

2 a liquid crystal display cell having a plurality of pixels arrayed in m rows and n columns
3 (m and n are positive integers), the plurality of pixels including a reference pixel for
4 determining a polarity array of display signals in each pixel row, and a plurality of scanning
5 lines and signal lines respectively for transmitting scanning signals and display signals to each
6 pixel;

7 a scanning signal supply circuit for supplying the scanning signals to said scanning
8 lines; and

9 a display signal supply circuit for supplying the display signals to the signal lines,
10 wherein said display signal supply circuit determines a polarity of the display signal to
11 be supplied to the reference pixel of each pixel row based on random number in a
12 predetermined frame, and determines a polarity in a frame subsequent to said predetermined
13 frame by reversing said polarity of the predetermined frame.

1 13. The liquid crystal display device according to claim 12, wherein said display signal supply
2 circuit determines polarities of other pixels in a row having the reference pixel therein such that
3 polarities of the pixels are regularly arrayed.

1 14. The liquid crystal display device according to claim 13, wherein said display signal supply
2 circuit determines polarities of other pixels such that each of the pixels in the same row has a
3 polarity reverse to that of adjacent pixels.

1 15. A liquid crystal display device comprising:

2 a liquid crystal display cell having a plurality of pixels arrayed in a dot matrix form;

3 a display signal supply circuit for supplying display signals to the plurality of pixels
4 such that polarities of the pixels constituting each row are regularly arranged, and the polarities
5 of pixels constituting each column are irregularly arranged; and

6 a scanning signal supply circuit for supplying scanning signals to the plurality of pixels.

1 16. The liquid crystal display device according to claim 15, wherein said display signal supply
2 circuit supplies the display signal based on random numbers in a predetermined frame, and
3 supplies the display signals whose polarities are reverse to those of said predetermined frame
4 in a frame immediately after said predetermined frame.

1 17. A driving method of a liquid crystal display device in which a
2 polarity of a voltage applied to each pixel is reversed for each frame,
3 the method comprising the steps of:

4 applying voltages of polarities based on random numbers for a first frame; and

5 applying voltages of polarities reverse to those of the first frame for a second frame
6 immediately after the first frame.

1 18. The driving method for the liquid crystal display device according to claim 17, wherein
2 said liquid crystal display device is a liquid crystal display device of an active matrix type
3 provided with elements for applying drive voltages to a liquid crystal material, and in said first
4 frame, the polarities of voltages applied to pixels are randomly arrayed in a scanning direction,
5 and the polarities of voltages applied to the pixels are regularly arrayed in a direction
6 orthogonal to the scanning direction.